



National Voluntary Laboratory Accreditation Program



CALIBRATION LABORATORIES

NVLAP LAB CODE 200495-0

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

North Carolina Standards Laboratory 4040 District Drive / 1051 Mail Service Center Raleigh, NC 27699-1051 Robert Rogers Phone: 919-733-4411 x211 Fax: 919-733-8804 E-mail: robert.rogers@ncagr.gov URL: http://www.ncagr.gov/standard	Fields of Calibration Dimensional Mechanical Thermodynamic This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (20/A01)
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
DIMENSIONAL			
LENGTH and DIAMETER, STEP GAGES (20/D05)			
Lottery Ball Pass Through Gauge	Dimensions	9.2 μ in	
MECHANICAL			
MASS DETERMINATION (20/M08)			
Metric	30 kg 25 kg 20 kg 10 kg 5 kg 3 kg 2 kg 1 kg 500 g 300 g 200 g 100 g 50 g 30 g 20 g 10 g 5 g 3 g	10 mg 10 mg 7.4 mg 5.1 mg 0.60 mg 0.37 mg 0.28 mg 73 μ g 36 μ g 25 μ g 19 μ g 17 μ g 7.2 μ g 4.9 μ g 3.8 μ g 3.5 μ g 1.8 μ g 1.2 μ g	Echelon I

2019-08-23 through 2020-03-31

Effective dates

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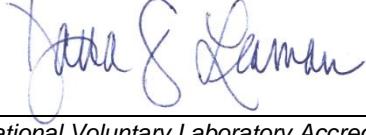
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Avoirdupois	2 g	0.95 µg	
	1 g	0.89 µg	
	500 mg	0.45 µg	
	300 mg	0.31 µg	
	200 mg	0.23 µg	
	100 mg	0.21 µg	
	50 mg	0.30 µg	
	30 mg	0.28 µg	
	20 mg	0.28 µg	
	10 mg	0.35 µg	
	5 mg	0.24 µg	
	3 mg	0.20 µg	
	2 mg	0.18 µg	
	1 mg	0.22 µg	
	50 lb	18 mg	
	30 lb	11 mg	
	25 lb	11 mg	
	20 lb	8.0 mg	
	10 lb	5.1 mg	
	5 lb	0.46 mg	
	4 lb	0.50 mg	
	3 lb	0.34 mg	
	2 lb	0.068 mg	
	1 lb	0.077 mg	
	0.5 lb	0.17 mg	
	0.3 lb	0.16 mg	
	0.2 lb	0.17 mg	
	0.1 lb	0.20 mg	
	0.05 lb	98 µg	
	0.03 lb	59 µg	
	0.02 lb	39 µg	
	0.01 lb	20 µg	
	0.005 lb	10 µg	
	0.003 lb	6.1 µg	
	0.002 lb	4.2 µg	

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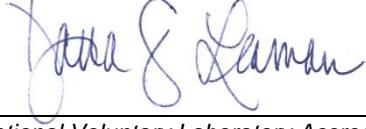
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Metric	0.001 lb	2.7 µg	Echelon II
	250 kg	2.5 g	
	200 kg	2.1 g	
	100 kg	0.71 g	
	30 kg	10 mg	
	25 kg	10 mg	
	20 kg	7.4 mg	
	10 kg	5.1 mg	
	5 kg	0.60 mg	
	3 kg	0.37 mg	
	2 kg	0.28 mg	
	1 kg	73 µg	
	500 g	36 µg	
	300 g	25 µg	
	200 g	19 µg	
	100 g	17 µg	
	50 g	7.2 µg	
	30 g	4.9 µg	
	20 g	3.8 µg	
	10 g	3.5 µg	
	5 g	1.8 µg	
	3 g	1.2 µg	
	2 g	0.95 µg	
	1 g	0.89 µg	
	500 mg	0.45 µg	
	300 mg	0.31 µg	
	200 mg	0.23 µg	
	100 mg	0.21 µg	
	50 mg	0.30 µg	
	30 mg	0.28 µg	
	20 mg	0.28 µg	
	10 mg	0.35 µg	
	5 mg	0.24 µg	
	3 mg	0.20 µg	
	2 mg	0.18 µg	

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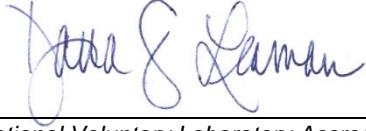
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Avoirdupois	1 mg	0.22 µg	Echelon III
	2500 lb	20 g	
	1000 lb	1.8 g	
	500 lb	0.72 g	
	100 lb	54 mg	
	50 lb	18 mg	
	30 lb	11 mg	
	25 lb	11 mg	
	20 lb	8.0 mg	
	10 lb	5.1 mg	
	5 lb	0.46 mg	
	4 lb	0.50 mg	
	3 lb	0.34 mg	
	2 lb	0.068 mg	
	1 lb	0.077 mg	
	0.5 lb	0.17 mg	
	0.3 lb	0.16 mg	
	0.2 lb	0.17 mg	
	0.1 lb	0.20 mg	
Metric	0.05 lb	98 µg	Echelon III
	0.03 lb	59 µg	
	0.02 lb	39 µg	
	0.01 lb	20 µg	
	0.005 lb	10 µg	
	0.003 lb	6.1 µg	
	0.002 lb	4.2 µg	
	0.001 lb	2.7 µg	
Metric	1000 kg	27 g	Echelon III
	500 kg	5.3 g	
	250 kg	3.2 g	
	200 kg	2.7 g	
	100 kg	1.6 g	
	50 kg	0.30 g	
	30 kg	0.18 g	

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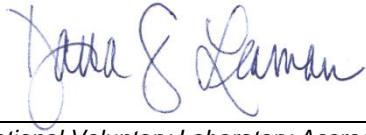
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	25 kg	0.15 g	
	20 kg	0.13 g	
	10 kg	74 mg	
	5 kg	30 mg	
	3 kg	18 mg	
	2 kg	13 mg	
	1 kg	7.5 mg	
	500 g	5.4 mg	
	300 g	5.1 mg	
	200 g	1.2 mg	
	100 g	0.63 mg	
	50 g	0.42 mg	
	30 g	0.52 mg	
	20 g	0.37 mg	
	10 g	0.32 mg	
	5 g	0.26 mg	
	3 g	0.11 mg	
	2 g	89 µg	
	1 g	60 µg	
	500 mg	45 µg	
	300 mg	36 µg	
	200 mg	31 µg	
	100 mg	24 µg	
	50 mg	19 µg	
	30 mg	17 µg	
	20 mg	15 µg	
	10 mg	12 µg	
	5 mg	10 µg	
	3 mg	9.1 µg	
	2 mg	8.1 µg	
	1 mg	7.0 µg	
Lottery Balls	Dimensions	55 mg	Echelon III
Avoirdupois	2500 lb	34 g	Echelon III
	2000 lb	27 g	

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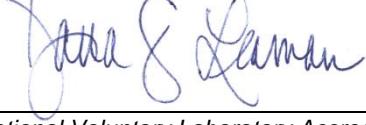
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	1000 lb	3.9 g	
	500 lb	1.8 g	
	100 lb	0.29 g	
	50 lb	0.14 g	
	30 lb	93 mg	
	25 lb	81 mg	
	20 lb	70 mg	
	10 lb	28 mg	
	5 lb	14 mg	
	4 lb	11 mg	
	3 lb	9.2 mg	
	2 lb	7.0 mg	
	1 lb	5.6 mg	
	0.5 lb	4.9 mg	
	0.3 lb	1.2 mg	
	0.2 lb	1.0 mg	
	0.1 lb	0.67 mg	
	0.05 lb	0.43 mg	
	0.03 lb	0.32 mg	
	0.02 lb	0.30 mg	
	0.01 lb	0.26 mg	
	0.005 lb	0.24 mg	
	0.003 lb	77 µg	
	0.002 lb	60 µg	
	0.001 lb	43 µg	
	4 oz	1.1 mg	
	2 oz	0.68 mg	
	1 oz	0.44 mg	
	1/2 oz	0.35 mg	
	1/4 oz	0.27 mg	
	1/8 oz	0.24 mg	
	1/16 oz	87 µg	
	1/32 oz	60 µg	
Weight Carts	6000 lb	120 g	Echelon III

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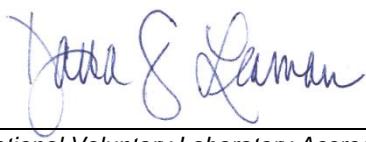
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	5500 lb 5000 lb 4500 lb 4000 lb 3000 lb	92 g 100 g 79 g 75 g 62 g	
VOLUME and DENSITY (20/M12)			
Volume	100 gal 60 gal 50 gal 25 gal 15 gal 10 gal 5 gal 5 gal	3.0 in ³ 1.2 in ³ 0.90 in ³ 0.69 in ³ 0.19 in ³ 0.29 in ³ 0.27 in ³ 0.19 in ³	Transfer Method 4 in neck 3 in neck
	100 gal 50 gal 25 gal 24 gal	3.7 in ³ 3.0 in ³ 2.1 in ³ 3.1 in ³	LPG Transfer Method
Test Measure	5 gal 5 gal 5 gal	0.20 in ³ 0.21 in ³ 0.12 in ³	4 in neck 3 in neck 2 in neck
Prover	100 gal 50 gal 15 gal	0.70 in ³ 0.31 in ³ 0.38 in ³	
Flask	100 mL 1 qt 1 gill	0.24 mL 1.0 mL 0.093 mL	
Slicker Standard	5 gal 1 gal	0.035 in ³ 0.017 in ³	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Small Volume Prover	30 gal 20 gal 15 gal 5 gal	1.5 in ³ 0.73 in ³ 0.57 in ³ 0.27 in ³	Gravimetric Method
THERMODYNAMIC			
LABORATORY THERMOMETERS, DIGITAL AND ANALOG (20/T03)			
Liquid in Glass and Digital	-30 °C to 95 °C 95 °C to 230 °C 230 °C to 660 °C -22 °F to 203 °F 203 °F to 446 °F 446 °F to 1220 °F	0.0090 °C 0.019 °C 0.069 °C 0.016 °F 0.034 °F 0.12 °F	Comparison to PRT Comparison to PRT
RESISTANCE THERMOMETRY (20/T07)			
	-30 °C to 95 °C 95 °C to 230 °C 230 °C to 660 °C -22 °F to 203 °F 203 °F to 446 °F 446 °F to 1220 °F	0.0052 °C 0.015 °C 0.061 °C 0.0094 °F 0.027 °F 0.11 °F	Comparison Comparison
END			

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Notes

Note 1: A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

Note 2: Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

Note 3: The uncertainty associated with a measurement in a CMC is an expanded uncertainty with a level of confidence of approximately 95 %, typically using a coverage factor of $k = 2$. However, laboratories may report a coverage factor different than $k = 2$ to achieve the 95 % level of confidence. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

Note 3a: The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

Note 3b: As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

Note 3c: As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.5. of NIST Handbook 150, Procedures and General Requirements.

Note 4: Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

Note 5: Values listed with percent (%) are percent of reading or generated value unless otherwise noted.

Note 6: NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

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